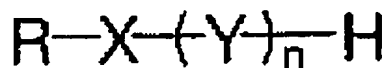


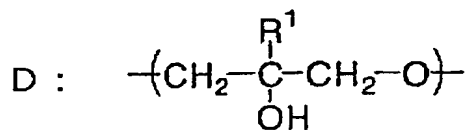
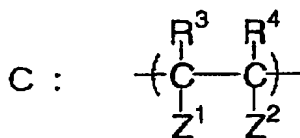
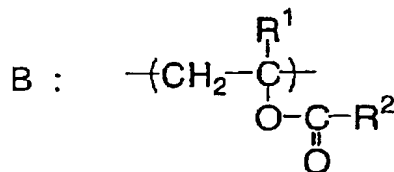
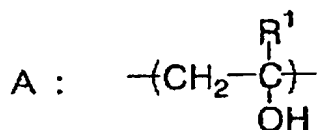
WHAT IS CLAIMED IS:

1. An ink-jet recording ink comprising colored fine particles including an oil-soluble dye and an oil-soluble polymer, and a compound represented by formula (I):



Formula (I)

wherein, in formula (I), R represents a hydrophobic group or a group derived from a hydrophobic polymer; X represents a divalent linking group having a hetero-bond; Y represents a group including at least one represented by the following structural units A, C and D, and the following structural unit B at 0 to 40% by mole; and n is an integer of 10 to 3,500;



wherein, in the structural units A, B, C and D, R<sup>1</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>6</sub> alkyl group; R<sup>2</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>10</sub> alkyl group; R<sup>3</sup> represents a hydrogen atom or a methyl group; R<sup>4</sup> represents a hydrogen atom, -CH<sub>3</sub>, -CH<sub>2</sub>COOH (including an ammonium salt or an alkali metal salt thereof) or -CN; Z<sup>1</sup> represents a

hydrogen atom,  $-\text{COOH}$  (including an ammonium salt or an alkali metal salt thereof) or  $-\text{CONH}_2$ ;  $Z^2$  represents  $-\text{COOH}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{OSO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{CH}_2\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{CONHC}(\text{CH}_3)_2\text{CH}_2\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof) or  $-\text{CONHCH}_2\text{CH}_2\text{CH}_2\text{N}^+(\text{CH}_3)_3\text{Cl}^-$ .

2. The ink-jet recording ink according to claim 1, wherein the oil-soluble polymer has a dissociable group in an amount of 0.2 to 4.0 mmol/g.

3. The ink-jet recording ink according to claim 2, wherein the dissociable group is at least one of a carboxyl group and a sulfonic acid group.

4. The ink-jet recording ink according to claim 1, wherein the colored fine particles are prepared by adding to an aqueous phase an organic phase including the oil-soluble dye and the oil-soluble polymer, and emulsifying and dispersing a resultant mixture.

5. The ink-jet recording ink according to claim 1, wherein the oil-soluble dye is selected from the group consisting of an anthraquinone dye, naphthoquinone dye, styryl dye, indoaniline dye, azo dye, nitro dye,

coumarin dye, methine dye, porphyrin dye, azaporphyrin dye and phthalocyanine dye.

6. The ink-jet recording ink according to claim 1, wherein the oil-soluble dye is contained in an amount of 0.05 to 50% by mass based on a total mass of the ink.

7. The ink-jet recording ink according to claim 1, wherein the oil-soluble polymer is contained in an amount of 10 to 500% by mass based on a mass of the oil-soluble dye.

8. The ink-jet recording ink according to claim 1, wherein the compound represented by formula (I) is contained in an amount of 1 to 50% by mass based on a mass of the colored fine particles.

9. The ink-jet recording ink according to claim 1, having a viscosity of 30 mPa·s or less.

10. The ink-jet recording ink according to claim 1, wherein the hydrophobic group represented by R in formula (I) is an aliphatic group or an aromatic group.

11. The ink-jet recording ink according to claim 10, wherein the hydrophobic group represented by R in formula (I) is an alicyclic group.

12. The ink-jet recording ink according to claim 10, wherein the hydrophobic group represented by R in formula (I) is selected from the group consisting of alkyl, alkenyl, alkynyl, phenyl and naphthyl groups.

13. The ink-jet recording ink according to claim 12, wherein the hydrophobic group represented by R in formula (I) is an alkyl group having 3 to 70 carbon atoms.

14. The ink-jet recording ink according to claim 1, wherein R in formula (I) is a group derived from at least one hydrophobic polymer selected from the group consisting of polystyrene, polymethacrylate, polyacrylate, polyvinyl chloride, and derivatives thereof.

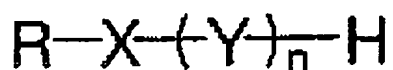
15. The ink-jet recording ink according to claim 13, wherein a polymerization degree of R in formula (I) is from 2 to 500.

16. The ink-jet recording ink according to claim 1, wherein the hetero-bond in X in formula (I) is selected from the group consisting of an ether bond, an ester bond, a thioether bond, a thioester bond, a sulfonyl bond, an amide bond, an imide bond, a sulfonamide bond, a urethane bond, a urea bond, and a thiourea bond.

17. The ink-jet recording ink according to claim 1, wherein the structural unit A is a structural unit derived from vinyl alcohol,  $\alpha$ -methylvinyl alcohol, or  $\alpha$ -propylvinyl alcohol.

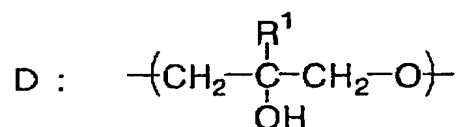
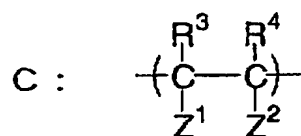
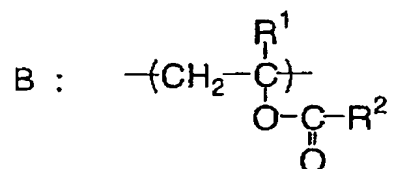
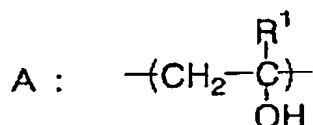
18. The ink-jet recording ink according to claim 1, wherein the structural unit B is a structural unit derived from vinyl acetate, vinyl formate, vinyl propionate, or an  $\alpha$ -substitution product thereof.
19. The ink-jet recording ink according to claim 1, wherein the structural unit C is a structural unit derived from acrylic acid, methacrylic acid, itaconic acid, maleic acid, an ammonium salt thereof or a metal salt thereof.
20. The ink-jet recording ink according to claim 1, wherein the structural unit D is selected from the group consisting of  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O}-$ ,  $-\text{CH}_2\text{C}(\text{CH}_3)(\text{OH})\text{CH}_2\text{O}-$ , and  $-\text{CH}_2\text{C}(\text{C}_2\text{H}_5)(\text{OH})\text{CH}_2\text{O}-$ .
21. The ink-jet recording ink according to claim 1, wherein a mass ratio of R to  $(\text{Y})_n$  in formula (I) is from 0.01 to 2, the mass ratio being calculated using atomic weights of respective atoms in R and  $(\text{Y})_n$ .
22. The ink-jet recording ink according to claim 1, wherein  $(\text{Y})_n$  in formula (I) comprises, as a structural unit thereof, ethylene, propylene, isobutene, acrylonitrile, acrylamide, methacrylamide, N-vinylpyrrolidone, vinyl chloride or vinyl fluoride.
23. The ink-jet recording ink according to claim 1, further comprising water.

24. An image-forming method to form an image, comprising using an ink-jet recording ink comprising colored fine particles including an oil-soluble dye and an oil-soluble polymer, and a compound represented by formula (I):



Formula (I)

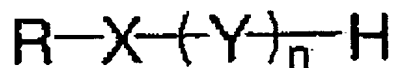
wherein, in formula (I), R represents a hydrophobic group or a group derived from a hydrophobic polymer; X represents a divalent linking group having a hetero-bond; Y represents a group including at least one represented by the following structural units A, C and D, and the following structural unit B at 0 to 40% by mole; and n is an integer of 10 to 3,500;



wherein, in the structural units A, B, C and D, R<sup>1</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>6</sub> alkyl group; R<sup>2</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>10</sub> alkyl group; R<sup>3</sup> represents a hydrogen atom or a methyl group; R<sup>4</sup> represents a hydrogen atom, -CH<sub>3</sub>, -CH<sub>2</sub>COOH (including an

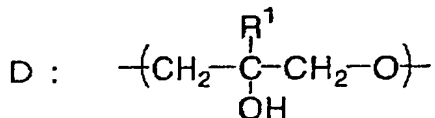
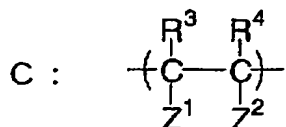
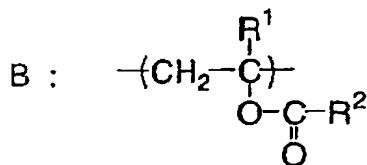
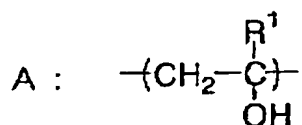
ammonium salt or an alkali metal salt thereof) or  $-\text{CN}$ ;  $Z^1$  represents a hydrogen atom,  $-\text{COOH}$  (including an ammonium salt or an alkali metal salt thereof) or  $-\text{CONH}_2$ ;  $Z^2$  represents  $-\text{COOH}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{OSO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{CH}_2\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof),  $-\text{CONHC}(\text{CH}_3)_2\text{CH}_2\text{SO}_3\text{H}$  (including an ammonium salt or an alkali metal salt thereof) or  $-\text{CONHCH}_2\text{CH}_2\text{CH}_2\text{N}^+(\text{CH}_3)_3\text{Cl}^-$ .

25. An ink-jet recording ink comprising colored fine particles including an oil-soluble dye and a photopolymerizable monomer, and a compound represented by formula (I):



Formula (I)

wherein, in formula (I), R represents a hydrophobic group or a group derived from a hydrophobic polymer; X represents a divalent linking group having a hetero-bond; Y represents a group including at least one represented by the following structural units A, C and D, and the following structural unit B at 0 to 40% by mole; and n is an integer of 10 to 3,500;



wherein, in the structural units A, B, C and D, R<sup>1</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>6</sub> alkyl group; R<sup>2</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>10</sub> alkyl group; R<sup>3</sup> represents a hydrogen atom or a methyl group; R<sup>4</sup> represents a hydrogen atom, -CH<sub>3</sub>, -CH<sub>2</sub>COOH (including an ammonium salt or an alkali metal salt thereof) or -CN; Z<sup>1</sup> represents a hydrogen atom, -COOH (including an ammonium salt or an alkali metal salt thereof) or -CONH<sub>2</sub>; Z<sup>2</sup> represents -COOH (including an ammonium salt or an alkali metal salt thereof), -SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -OSO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -CH<sub>2</sub>SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -CONHC(CH<sub>3</sub>)<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof) or -CONHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>Cl<sup>-</sup>.

26. The ink-jet recording ink according to claim 25, wherein the colored fine particles are prepared by adding to an aqueous phase an organic phase including the oil-soluble dye and the photopolymerizable



monomer, and emulsifying and dispersing a resultant mixture.

27. The ink-jet recording ink according to claim 25, wherein the hydrophobic group is an aliphatic group, an aromatic group or an alicyclic group.

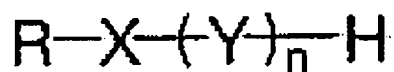
28. The ink-jet recording ink according to claim 25, wherein R is a group derived from at least one hydrophobic polymer selected from polystyrene, polymethacrylate, polyacrylate, polyvinyl chloride, and derivatives thereof.

29. The ink-jet recording ink according to claim 25, wherein the oil-soluble dye is selected from the group consisting of an anthraquinone dye, naphthoquinone dye, styryl dye, indoaniline dye, azo dye, nitro dye, coumarin dye, methine dye, porphyrin dye, azaporphyrin dye and phthalocyanine dye.

30. The ink-jet recording ink according to claim 25, wherein the oil-soluble dye is contained in an amount of 0.05 to 50% by mass based on a total mass of the ink.

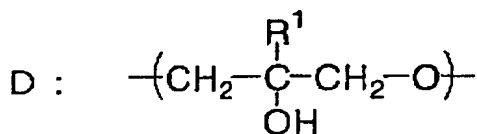
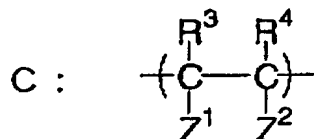
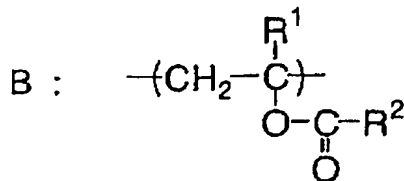
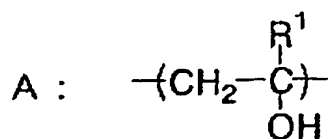
31. The ink-jet recording ink according to claim 25, wherein the compound represented by formula (I) is contained in an amount of 1 to 50% by mass based on a mass of the colored fine particles.

32. The ink-jet recording ink according to claim 25, wherein the photopolymerizable monomer is contained in an amount of 50 to 500% by mass based on a mass of the oil-soluble dye.
33. The ink-jet recording ink according to claim 25, having a viscosity of 30 mPa·s or less.
34. An image-forming method to form an image, comprising using an ink-jet recording ink comprising colored fine particles including an oil-soluble dye and a photopolymerizable monomer, and a compound represented by formula (I):



Formula (I)

wherein, in formula (I), R represents a hydrophobic group or a group derived from a hydrophobic polymer; X represents a divalent linking group having a hetero-bond; Y represents a group including at least one represented by the following structural units A, C and D, and the following structural unit B at 0 to 40% by mole; and n is an integer of 10 to 3,500;



wherein, in the structural units A, B, C and D, R<sup>1</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>6</sub> alkyl group; R<sup>2</sup> represents a hydrogen atom or a C<sub>1</sub> - C<sub>10</sub> alkyl group; R<sup>3</sup> represents a hydrogen atom or a methyl group; R<sup>4</sup> represents a hydrogen atom, -CH<sub>3</sub>, -CH<sub>2</sub>COOH (including an ammonium salt or an alkali metal salt thereof) or -CN; Z<sup>1</sup> represents a hydrogen atom, -COOH (including an ammonium salt or an alkali metal salt thereof) or -CONH<sub>2</sub>; Z<sup>2</sup> represents -COOH (including an ammonium salt or an alkali metal salt thereof), -SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -OSO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -CH<sub>2</sub>SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof), -CONHC(CH<sub>3</sub>)<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>H (including an ammonium salt or an alkali metal salt thereof) or -CONHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>Cl<sup>-</sup>.